



DEPARTMENT OF THE NAVY

ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

N62661.AR.002004
NAVSTA NEWPORT RI
5090.3a

IN REPLY REFER TO

5090
Code EV23/CF
December 7, 2005

Ms. Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section
USEPA Region 1
1 Congress Street, Suite 1100
Boston MA, 02114-2023

Mr. Paul Kulpa, Project Manager
Office of Waste Management
Rhode Island Department Of Environmental Management
235 Promenade St.
Providence Rhode Island, 02908-5767

Kenneth Finkelstein, Ph.D.
National Oceanic and Atmospheric Admin.
National Ocean Service
Office of Response & Restoration
Coastal Protection and Restoration Division
c/o EPA Office of Site Remediation and Restoration (HIO)
1 Congress Street
Boston, MA 02114

SUBJECT: DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT (JULY
2005) FOR SITE 009, OLD FIREFIGHTING TRAINING AREA,
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

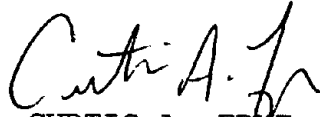
Dear Ms. Keckler/ Mr. Kulpa/ Dr. Finkelstein:

The Navy's responses to EPA, NOAA, and RIDEM comments on the subject document are provided as enclosures (1) through (4). RIDEM recently submitted additional comments on the forensics portion of the report; responses to these comments will be forwarded separately. As I have discussed at recent RPM meetings, this document is key to the review being conducted by the OFFTA Optimization Review Team.

If there are any additional questions or comments, please contact me at (610) 595-0567 extension 142 to arrange a conference call or meeting to facilitate reaching consensus.

5090
Code EV23/CF
December 7, 2005

Sincerely,



CURTIS A. FRYE, P.E.
Remedial Project Manager
By direction of the
Commanding Officer

Enclosures:

1. Responses to USEPA Comments, Draft Sediment and Groundwater Monitoring Report, Site 009, Old Firefighting Training Area, Naval Station Newport, Newport, RI, July 2005 (Comments of September 7, 2005)
2. Responses to USEPA Comments on the Hydrocarbon Characterization (Appendix E to the Draft Sediment and Groundwater Monitoring Report) Site 009, Old Firefighting Training Area, Naval Station Newport, Newport, RI, July 2005 (Comments of September 7, 2005)
3. Responses to NOAA Comments, Draft Sediment and Groundwater Monitoring Report, Site 009, Old Firefighting Training Area, Naval Station Newport, Newport, RI, July 2005 (Comments of August 4, 2005)
4. Responses to RIDEM Comments, Draft Sediment and Groundwater Monitoring Report, Site 009, Old Firefighting Training Area, Naval Station Newport, Newport, RI, July 2005 (Comments of September 13, 2005)

Copy to:

C. Mueller, NSN
S. Parker, TtNUS
J. Stump, Gannett Fleming

**RESPONSES TO COMMENTS FROM THE USEPA
DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT, JULY 2005
OLD FIREFIGHTING TRAINING AREA, NAVSTA NEWPORT
Comments Dated September 7, 2005**

Comment 1 §2.3.2 The text incorrectly indicates a construction worker scenario was not evaluated in the human health risk assessment. A construction worker scenario was part of the human health risk assessment.

Response: The text of the report is correct: A construction worker scenario was not included in the groundwater risk assessment presented in the FS report (TtNUS 2/02 Appendix B). A construction worker scenario was included in the soil risk evaluations, but this is not the context of the section.

Comment 2 Table 4-4: Analytical results for rejected data should not be included in summary tables for any sampling event. Rejected results for arsenic are included in Table 4-4 and should be removed.

Response: Concur: The "R" flagged values will be removed from the summary tables, and the reason the data was rejected will be noted.

Comment 3 §4.2: The statement, "...PAH concentrations generally decrease with depth..." is not adequately supported by the information presented in Table 4-3 as the sample depths are not specified in Table 4-3! Please clearly provide sample depths in the table.

Response: Concur: The depths of the samples will be provided in separate fields in the top rows with the sample information.

Comment 4 §4.2: Please confirm whether the statement, "...overall PAH concentrations appear to be declining in the shoreline sediments between the sampling events in 1998, 2001, and 2005..." is based on point comparisons. Table 4-3 displays the 1998 result next to the 2005 result per sediment sample location for locations OFF-1 through OFF-7. Table 4-3 displays the 2001 result next to the 2005 result per sediment sample location for locations OFF- SD-411 through OFF-SD-445.

Response: A summary has been prepared to present the point comparisons noted. It should be clarified that this comparison is for surface sediments only. As stated in the text, not all stations were sampled in 1998, 2001 and 2005. However, the overall trend is clear using the point comparisons described below:

Table 1 Response to EPA Comment 4

Sample Location	Sample Dates	Decreased over time?
OFF-1	3/27/98, 2/22/05	No
OFF-2	3/27/98, 2/22/05	Yes
OFF-3	3/27/98, 2/23/05	Yes
OFF-4	3/27/98, 2/23/05	Yes
OFF-5	3/27/98, 2/23/05	Yes
OFF-6	3/27/98, 2/23/05	Yes
OFF-7	3/27/98, 2/22/05	Yes
SD-411	11/13/01, 2/23/05	Yes
SD-413	11/13/01, 2/23/05	No
SD-414	11/13/01, 2/23/05	Yes
SD-417	11/13/01, 2/23/05	Slightly*
SD-424	11/13/01, 2/23/05	Slightly*
SD-432	11/13/01, 2/23/05	No
SD-439	10/29/01, 2/22/05	Yes
SD-442	11/9/01, 2/23/05	Yes
SD-445	11/13/01, 2/23/05	Yes

* Concentrations are similar enough to be considered the same.

Comment 5

§4.2.2: The text in this subsection repeats itself and contains typographical errors. The text needs to be corrected to ensure intended information is presented.

Response: A fragment of text at the bottom of page 4-3 is repeated on page 4-4. The section will be reviewed and revised in accordance with responses to comments to Appendix E.

Comment 6

§5: The summary and analysis section includes the statement that groundwater conditions are acceptable. This sentence should be deleted. Both lead and manganese were detected in the 2004 sampling event at concentrations that exceed the PRGs. Manganese is identified on page 2-5 as a risk driver in the groundwater risk assessment.

Response: Although PRGs were exceeded for manganese (which may be naturally occurring) those PRGs were calculated based on residential use of groundwater as a potable source. The statement in the text is correct: "groundwater conditions are acceptable in a location where only incidental contact with groundwater is likely." Therefore, the statement should remain, although it may be appended to note the likely types of contact for a construction worker (i.e., incidental ingestion and dermal contact only).

Comment 7

§5: The statement that current sediment data as compared to previous data shows improvement is contrary to a conclusion in the Appendix E forensic study. The 2005 forensic study states that hydrocarbon concentrations and PAH compositions were very stable between 2002 and 2005. Please clarify.

Response: The text states that compositions are stable but concentrations are decreasing. This would indicate that the contaminants present are the same, but the concentrations are lower. Further, this is an indication that conditions are improving, and not a contradiction.

**RESPONSES TO COMMENTS FROM THE USEPA
ON THE HYDROCARBON CHARACTERIZATION, JULY 2005
OLD FIREFIGHTING TRAINING AREA, NAVSTA NEWPORT
(APPENDIX E TO THE DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT)
Comments Dated September 7, 2005**

1. *This document describes the characterization of hydrocarbon compounds in sediments from Coasters Harbor adjacent to the OFFTA. The primary objectives of this work were to determine the relationship between the hydrocarbon composition of Coasters Harbor sediments and that of a Reference Area (Jamestown Potter Cove, JPC), and to ascertain the extent to which Coasters Harbor sediments may have been impacted by recent site remediation activities at the OFFTA.*

The distinction between OFFTA generated pyrogenic PAHs and pyrogenic PAHs from other sources (e.g. pavement needs) to be clarified. Moreover, the methodology for making this distinction should be clearly stated.

Response 1:

The PAHs associated with the OFFTA are predominantly derived from petroleum products. These OFFTA derived materials are predominantly petrogenic in origin. The 2- and some of the 3-ring petrogenic PAHs likely originated from diesel (e.g., No. 2 Fuel Oil). The 4-ring and most of the 3-ring petrogenic PAHs were primarily associated with heavy fuel oil.

These petrogenic 2- to 4-ring PAHs can come from numerous other sources as well. Other sources can include diesel and heavy fuel oil from non-OFFTA sources. In addition, these PAHs can come from chronic vehicular emissions and abraded pavement. Other non-point contributions include pyrogenic PAHs from storm drain runoff and atmospheric fallout.

Identifying the origin of PAHs in the sediment is a stepwise process that depends on several factors. This process begins with a general discussion of concentrations of carbon-containing materials. Thereafter, the hydrocarbon composition, PAH, and biomarker compositions are evaluated. At each step, the composition of the sediment samples are compared to those of the source area (e.g., contaminated soils from OFFTA, pavement samples from the OFFTA shoreline, and selected reference standards of kerosene and diesel). As described in the forensics report, the similarities and differences among the source and release area samples provide multiple lines of evidence for determining the most likely origin of PAHs in the study area.

For this project, the weathered diesel and heavy fuel oil associated with the OFFTA were not evident in the sediment samples. This finding ruled severely against the candidacy of OFFTA derived hydrocarbons in the proximal sediments. By contrast, the sediments contained a complex mixture of diesel range petroleum containing high levels of normal alkanes mixed with weathered heavy range petroleum and pyrogenic PAHs consistent with non-OFFTA sources (e.g., background and tar containing pavement). The inconsistent degree of weathering between the diesel signatures and the saturate/biomarker patterns in the sediment samples could not have originated from the petroleum residues in the soils impacted by OFFTA activities.

We will review the report text to further illustrate the lines of evidence and conclusion pathway when possible. Additional reference samples will be added from other forensic investigations.

2. *The document fails to identify and sufficiently explain the uncertainties associated with the study. An essential aspect of good scientific practice (beyond stating and interpreting the results) is that before conclusions are made, the uncertainty surrounding the data should be identified, explored,*

Enclosure (2)

and then explained. Please revise the document to include an uncertainty section. The report needs to include a discussion on the uncertainties surrounding the data on the fingerprinting analysis and explain how these uncertainties affect the conclusions drawn by the Navy from those data.

Response 2:

The report appendices provide a robust set of quality control (QC) results that demonstrate an adequate level of precision, accuracy, comparability, sensitivity for the project objectives. These results assumed the form of procedural blanks, spike recoveries (surrogate and target analyte spikes), duplicate percent differences, and reference sample comparisons. While most of these QC samples are well understood, it must be clarified that the reference sample is a crude oil run throughout the study period. It contains a full suite of parent PAHs, alkylated PAHs, saturates and biomarkers. Collectively, these reference samples provide performance data on most of the target analytes used throughout this forensic investigation.

These QC results will be discussed in the revised report as part of an uncertainty analysis.

3 - 7 *As EPA has commented previously, the report should consider crankcase oil from cars/machinery because it is a major source of hydrocarbon pollution to the coastal marine environment. Although urban runoff was cited as contributing to the contamination, it was generally associated with asphalt and not crankcase oil. Most of the work done on petroleum hydrocarbons in urban runoff reveal used crankcase oil as the major component of the hydrocarbons present (contributing both aliphatic and aromatic constituents). If crankcase oil was considered explicitly it is likely that it would have been identified as a source. EPA recommends the following specific changes/additions:*

- **3. evaluate used crankcase oil as a source (for both PAHs and aliphatics)**

Response 3: Available data from crankcase oil will be added to the revised report.

- **4. include figures that have the FID and GC/MS signatures of the source fuel oils, asphalt (and the used crankcase oil)**

Response 4: The revised report will contain additional data on fuel oils, asphalt, and crankcase reference samples.

- **5. since the OFFTA was used before 1990, the sediment samples (0-15 cm) may not be deep enough to capture the correct depth of deposition. Depending upon the sedimentation rate in the harbor, the sediment containing the horizons with the proper time frame were not sampled, or may have been diluted by less contaminated more recent sediments.**

Response 5: Our goal in this project was to improve the understanding of OFFTA related hydrocarbons in relation to risks attributed to surface sediments. The sampling interval of 0-15 cm was selected because this is the depth interval relevant for the associated risk assessment. The reader is referred to the Work Plan for Sediment and Groundwater Monitoring (TtNUS, November 2004).

- *6. the background site in Jamestown was referred to as either Porter or Potter cove. Please note that there is a Potter Cove located on the next island north of Jamestown (Prudence Island). It is odd that two coves within 5 miles of each other have the same name.*

Response 6: The Reference Area is Jamestown Potter Cove (JPC). The typo in the Executive Summary (Jamestown Porter Cove) will be corrected in the revised report.

- *7. Figure 3 has Allen Harbor in the caption within the figure and is labeled Figure 2.1. This is an error since Allen Harbor is on the mainland and not anywhere near Coasters Harbor (which is not labeled on the figure).*

Response 7: Figure 1 contained extraneous text that will be removed from the revised report.

- 8. The report contains a detailed description of the analytical methods that were used to develop the fingerprints that characterize different types of hydrocarbon materials. Principal Components Analysis (PCA) is used to determine the factors that are most responsible for variability in the data. The report concludes that the hydrocarbon mixtures in the Study Area and in the Reference Area are similar and are attributed to abraded pavement and emissions from vehicular traffic.*

An insufficient number of reference/background location sediment samples are used to characterize the regional background hydrocarbon signatures. As stated in the text of the subject report, the sampling strategy was based on Navy guidance (Stout et al., 2003). The seventh paragraph, page 12, of Section 1.5.3.1 in this guidance document discusses sampling design strategy. In particular, the need to collect samples that are representative of background (not site-impacted) conditions is emphasized:

"Given the importance of background samples in demonstrating the concentrations of contaminants beyond the control of the Navy, the number of background samples needed to meet the objectives of the study should be carefully considered. Population statistics are vital to the defensibility of the conclusions and should be qualitatively and quantitatively considered."

It appears that the regional background signature in Narragansett Bay is defined by only one location, in Jamestown Potter Cove. The basis for limiting the background sampling to this area, and to two samples (one in 2002, one in 2005), is not clear. If this rationale was supplied in the previous study to which the author refers (Emsbo-Mattingly, 2002), a summary description of the reference area and reason(s) for the limited background sampling should be included in this document.

Response 8:

Additional reference area samples will be added from other sediment studies conducted in the Narragansett Bay. These samples were collected from Coggeshall Cove, Jamestown Island, and Fishing Cove as part of the sediment study at the Navy Site 16, Davisville Sediment Investigation. As described in the earlier study from which these data are derived, these reference area samples represent regional hydrocarbon compositions expected in the Narragansett Bay. However, we anticipate some differences in hydrocarbon composition and concentration due to the higher density of roadways and land uses specific to the area around Newport, RI.

9. §2, ¶ 3 *Hydrocarbons in sediments adjacent to OFFTA were characterized in a previous study (Emsbo-Mattingly, 2002). This paragraph states that selected data from that investigation will be incorporated, where appropriate, for comparison to the 2005 results. Please indicate, for readers who may not have access to the previous report, whether the analytical methods that were used to derive the 2002 results are the same as, or at least comparable to, those used in the 2005 work.*

Response 9:

The analytical chemistry methods are comparable. Quality control results from both studies will be presented in the revised report to demonstrate this comparability. Specifically, comparable reference samples of crude oil were analyzed during both projects that demonstrate method comparability.

10. §3.6, ¶1: *The text indicates that "four methods of data visualization" were used in this report. These are, as listed: gas chromatograms, histograms, and Principal Components Analysis plots. What is the fourth method? If there is another method of data visualization that was used, please add it to the bullets listed.*

Response 10:

The fourth method is color coding. The fourth bullet will be added in the revised report.

11. §4.1: *Only two samples were used to represent OFFTA generated PAH contamination (SO-15 and SO-11). It seems improbable that these two soil samples could adequately represent the contamination that resulted from the fire training activities at the site.*

Response 11:

The OFFTA source samples (SO-11 and SO-15) were collected in areas of high hydrocarbon concentration based on past studies. These high concentration areas were sampled as reference points for the forensic report, because they likely represented the hydrocarbon mixtures released as part of the historical OFFTA activities. Similarly, the abraded pavement samples (DEBRIS1 and DEBRIS2) were submitted with the forensic sediment samples because they represented some of the most likely non-OFFTA sources of hydrocarbons in Coasters Harbor. Given the relative purity of these materials, they served as logical candidates of the hydrocarbon end-members for hydrocarbons in Coasters Harbor sediments.

A review of the historical TPH data (n > 200) helped demonstrate the degree to which these forensic end-member samples represented the dominant compositional features of hydrocarbons within the study area. Specifically, the overwhelming majority of the historical samples with diesel and heavy range material were heavily weathered and depleted of normal alkanes. These historical data also revealed the presence of tar derived materials, like those exhibited in the DEBRIS 2 sample. In summary, the historical data established that the source and pavement samples used in the forensic report adequately represented the most significant hydrocarbon patterns observed in the sediments collected from Coasters Harbor.

A brief discussion of the historical data will be added to the revised report.

12. §4.2, ¶1 This paragraph contains an excellent description of the differences in petrogenic, pyrogenic, and diagenetic PAH patterns and how these patterns are used to distinguish PAHs from different sources. The text states that the PAH data "are more reliable source indicators than the peak heights used in the simpler [GC/FID] hydrocarbon fingerprinting" because the latter are subject to a number of potential interferences. Please discuss the possible interferences or other analytical artifacts that may also affect the PAH analyses, and the extent and conditions under which such effects, if any, may be significant.

Response 12:

Analytical interferences are minimal in the forensic GC/MS method due to the ability of 1) the sample preparation method to remove polar and sulfur interferences, 2) the high resolution capillary column that separates target analytes with a high degree of efficiency, 3) the ability of the MS detector to isolate target analyte ion fragments, and 4) the extensive use of these forensic techniques in diverse samples collected around the world. Some interferences exist, but they always result in distorted fingerprints that are familiar to the environmental forensic investigator. None of these interferences were present in samples collected as part of this investigation to the degree that they adversely affected the interpretation.

13. §4.2, ¶3 This paragraph describes the apparent reduction in PAH concentrations at the OFFTA locations OFF-SD-OTS-075 and OTS-OF093, from 36.0 mg/kg EPA PAHs in 2002 to 21.9 mg/kg in 2005, and 14.6 mg/kg EPA PAHs in 2002 to 0.44 mg/kg in 2005, respectively. The text speculates that this reduction is because of a change in land use. How did the land use change over this three-year period, and how would the apparent reduction in PAH concentrations be attributed to this change? Is this referring to the storm water upgrade with an oil/water separator? Please add to this section a brief statement of other possible explanations, e.g. sampling variability, analytical uncertainty, differences in analytical methodology, etc.

Response 13:

The land use change refers to the pre-existing parking lot that was converted to a building plus a smaller parking lot equipped with a new Vortex storm water system. Other variability attributed to sampling or analysis was deemed minimal given the high degree of similarity in the methods used over the study period of 2002 to 2005. The use of comparable methodology is largely credited with the close compositional similarity in samples collected from locations other than OTS-OF093 collected in 2002 and 2005. Station 093 is the only exception to the remarkable stability demonstrated at other locations. It is no coincidence that the dramatic reduction in PAHs between 2002 and 2005 bracketed the period during which the storm water management system was upgraded to retain particulates. The association between heavy PAHs and particle adsorption is a known phenomenon. Consequently, it is highly likely that the reconfiguration of the built structures in the 093 drainage system plus the particle retaining storm water system led to the observed reduction in PAH concentrations over the study period from 2002 to 2005.

This discussion will be incorporated into the report.

14. §4.2, ¶6 The fourth and fifth sentences note that 5- and 6-ring PAHs in pavement samples may form from 'cooking' during the pavement manufacturing process, or they may indicate the presence of soot or other combustion byproducts. Pieces of eroded pavement are present along the shoreline adjacent to the OFFTA, and the report assumed that these are "the most likely and potent source of heavy pyrogenic PAHs." How would the characteristic PAH fingerprints of the combustion products of the various fuels used at the OFFTA compare to the 5- and 6-ring compounds found in paving samples? Please expand this discussion to address possible contributions of pyrogenic PAHs from historic kerosene and diesel combustion OFFTA activities. What are the signatures of combusted kerosene-range jet fuel, diesel-range marine fuel oil, and bunker-range heavy fuel oil and the soot that is produced by burning these materials? How would these compare to the reference standards (Table 1) – i.e., 50% and 100% combusted diesel and kerosene?

Response 14:

The historical generation of pyrogenic PAHs during OFFTA activities is unclear. However, the mass of pyrogenic PAHs produced during these relatively infrequent training events is likely not large compared to the chronic pyrogenic PAH emissions associated with residential, commercial, and vehicular activities around Newport, RI over the past hundred years. In addition, the pyrogenic PAHs generated during fire fighter training would be rapidly diluted in the atmosphere shortly after generation. Additional dilution would occur as these hydrocarbons passed from the air into the water.

Therefore, the residual hydrocarbons that remain after a fire fighter training exercise are predominantly composed of incompletely combusted petroleum that sinks into the ground. In addition, hydrocarbons associated with the OFFTA may be associated with fugitive petroleum from OFFTA pipe systems. Regardless of origin, these petroleum materials are dominated by petrogenic PAHs that are not evident in the sediments.

A brief discussion about differences between sediments and combusted fuel samples will be added to the report.

15. §5, bullet 4: The pervasive occurrence of low-level, lightly to moderately degraded diesel range hydrocarbons in the Reference Area and Coasters Harbor sediments is attributed to chronic releases from vehicular traffic. Why is the fingerprint characteristic of the diesel-range compounds not present in the 2002 sediments but occurs in nearly all of the 2005 samples (Table 3)? Please explain their absence in the earlier sampling.

Response 15:

The pervasive presence of diesel in 2005 was likely caused by a chronic or acute release from marine vessels after 2002. The relatively unweathered nature of this material may indicate a relatively recent release. The exact dating of this release was not possible with the available data. As presented in the report, these diesel signatures did not resemble the weathered diesel in the soils around the OFFTA.

16. §5, bullet 5: Samples of abraded pavement, collected near the storm sewer outfall OF075 yielded 4-ring petrogenic PAHs (asphalt) and pyrogenic 3- to-6-ring PAHs (tar). This observation leads to the conclusion that particulates from regional roadways are the primary source of the hydrocarbons in the Study Area sediments. Please explain the distinction between pyrogenic PAHs associated with paving materials and those arising from on-site activities at the former OFFTA (e.g., combustion of fire training fuels). (See also previous related comment).

Response 16:

Please refer to discussion about the differences between sediments and combusted fuel residues (see Newfields Response 14).

17. *Table 3: The report should specify whether the reference standards listed in Table 3 are the same standards that were used in the 2002 forensic study. The earlier study described the reference standards as follows. "Reference samples of kerosene and diesel were prepared and analyzed by Battelle as part of a previous forensic investigation of the former fire training area in Cutler, ME (Emsbo-Mattingly, 2002). In addition to the dispensed reference samples, each petroleum distillate was independently evaporated and combusted to better identify the compositional changes attributed to fire training activities and environmental weathering. Additional reference samples from the National Institute for Standards and Technology (NIST) and the Battelle Reference Material Library were added for comparison to samples collected from the site."*

Response 17:

The kerosene and diesel reference samples were the same in both studies. Text will be added to the revised report to clarify this relationship.

18. *Figure 5, a & b: The Principal Components Analysis Scores plots suggest that most of the Study Area sediment samples are similar to one another and are dominated by pyrogenic PAHs. Figure 5b shows an enlargement of the portion of Figure 5a in which most of the Study Area samples are clustered. The linear distribution of the data (Fig. 5b) suggests that the bulk of the sediments obtained their PAH signatures owing to mixing, with end members defined by the Reference Area samples (JPC03 and JPC03') and those from the storm sewer sediment (OF075). However, sample SO-15 (contaminated soil collected from a test pit at the OFFTA near the shoreline), which contains more pyrogenic PAHs, plots above and to the right of the cluster of sediment data but is still co-linear with the sediment data. Because the saturated fingerprints and triterpane biomarkers of SO-15 are similar to those of the sediment samples (Table 3), please explain why SO-15 is not considered as a possible end-member of the sediment mixture.*

Response 18:

The position of sample SO-15 in the PCA scores plot is based exclusively on the PAH composition. However, the overall composition of SO-15 is clearly distinct from the proximal sediments when other factors are considered. These other factors include the low amount of pyrogenic PAHs relative to the heavy residual range hydrocarbons. In addition, the high resolution hydrocarbon fingerprint, the saturate fingerprint, and the biomarker patterns are collectively inconsistent with the Coasters Harbor sediments.

The exclusion of SO-15 will be explained in greater detail in the revised report.

REFERENCES ON COMMENTS

- Emsbo-Mattingly, S. D., 2002, Environmental forensic investigation of hydrocarbon sources at the Old Fire Fighting Training Area: Naval Station Newport, Rhode Island. Final Report, TetraTech NUS, Wilmington, MA.
- Stout, S. A., Leather, J. M., and Corl, W. E. III, 2003, *A User's Guide for Determining the Sources of Contaminants in Sediments. A Demonstration Study: Sources of PAH in the Sediments of the Vicinity of the Norfolk Naval Shipyard, Elizabeth River, Norfolk, Virginia*. U.S. Dept. of the Navy, SPAWAR Systems Center, San Diego. Technical Report 1907, September 2003, 97 pp.

RESPONSES TO COMMENTS FROM NOAA
DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT, JULY 2005
OLD FIRE FIGHTING TRAINING AREA
NAVSTA NEWPORT
Comments Dated August 4, 2005

Comment 1: *Following review of the OFFTA FS in September 2002 NOAA supported the Navy monitoring plan except for Sampling Location #5 where both ecological risk was high and at least on PRG was compromised. We were also concerned about Stations 2, 3 and 6 that showed elevated total PAHs in the sediment. Although ecological PRGs were exceeded at sampling station 410, we agreed that the habitat value likely was more important than the possibility that the site would act as an attractive nuisance. After lengthy review, NOAA recommended the Navy to remove the sediment at Station #5 and monitor the other stations around the site that showed both intermediate risk and at least one contaminant above the PRG. Later in November 2002, the Navy collected 11 sediment samples around the shallow subtidal area and showed considerably lower sediment contaminant concentrations, including Station #5. And in early 2004, EPA also reported lower sediment concentrations in the offshore and some intertidal locations. Hence, it appeared that natural attenuation was taking place and/or the variability of the sediment concentrations was high.*

Response: Concur. The data, when taken collectively, indicates that the PAH concentrations are declining over time. Refer also to EPA Comment #4 (enclosure (1)). Additional assessments of this apparent trend are being undertaken. There does not appear to be any sedimentation occurring that would be covering the material, and thus it appears that either a source was removed or some sort of attenuation of previous contaminants is taking place.

Comment 2: *Tables 4-3 and 4-4 (sediment concentrations) make clear that the recent monitoring of the sediment shows concentrations below the ecological PRGs. Although NOAA does not comment on the human health PRGs, they nevertheless are exceeded in some locations. NOAA was also looking for a total PAH concentration in Table 4-3. Although total PAHs are not a PRG, such a value would provide a logical summary of the PAH data.*

Response: Concur. The total PAHs will be included in the revised report as a sum of the LMW and HMW PAHs presented.

Comment 3: *Likely, because of my difficulty reading the CD and moving around the document as needed, I find the results of the forensic analysis of the sediment confusing. Why is the anthropogenic source of the contamination – asphalt, marine fuels, and car emissions – so important? Is the Navy claiming that these constituents are not covered under CERCLA?*

Response: Future draft documents provided to NOAA will be in hard copy and on CD. Final documents will be provided on CD only to reduce paper and storage costs.

The anthropogenic contaminants (contaminants provided by pavement, runoff, ship traffic, from sites beyond OFFTA), while contributing to risk at the site, do need to be separated from those originating at the site as funding for cleanup of the site is only justifiable when site-related contaminants are causing the risk.

**RESPONSES TO COMMENTS FROM RIDEM
DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT, JULY 2005
OLD FIRE FIGHTING TRAINING AREA
NAVSTA NEWPORT
Comments Dated September 13, 2005**

**1. Section 4.1 Groundwater,
Page 4-1, Whole Section.**

This section of the report deals with contaminants of concern found in the groundwater. Waste oils were the primary contaminant disposed of at the site. Despite this fact this section of the report does not discuss petroleum contamination. Please modify this section to include a discussion of petroleum contamination in the groundwater including the presence of sheens, smear zones, TPH results, etc.

Response: The Navy does not agree that waste oils were the primary contaminant disposed of at the site. The TPH data in groundwater is provided in Table 4-2. A text summary of the TPH results will be provided in the revised report.

**2. Section 4.2.1 Non Forensic Analysis,
Page 4-3, 1st Paragraph.**

This paragraph states that overall PAH concentrations are decreasing across the site. A review of the data indicates that changes in concentration are variable. That is, contaminants may decrease with time, increase with time or fluctuate. The section of the report must clearly note this fact.

Response: Data collected and evaluated shows that overall PAH concentrations are decreasing with time. This is evidenced in a review of the data provided in Table 4-3 and summarized in the table presented with the response to EPA's comment No. 4 in this response summary.

**3. Section 4.2.1 Non Forensic Analysis,
Page 4-3, 1st Paragraph.**

This section of the report indicates that overall PAH concentrations are decreasing across the site. The report is a public document, and it is difficult for the public to review each sample location and each contaminant over time to evaluate trends. A visual aid to the public to see overall trends would be to place a field at the end of each sampling stations. In the field the letters I, D or F would be placed designating an increase, decrease or fluctuation in contaminant concentrations over time. The field could also be color-coded, i.e. a different color for each designation. This would allow the public to scan the results and get an overall feel for trends.

Response: For clarity the in-text tables provided in this response summary (EPA Comment 4 and RIDEM Comment 5) will be included and described in the revised report. This assessment will provide a visual aid for the public to comprehend the findings of the data evaluation.

**4. Section 4.2.1 Non Forensic Analysis,
Page 4-3, Third Paragraph.**

This section of the report notes that inputs from rubberizing asphalt and building debris may have affected PAH distribution. Please explain in detail these sources and how they could have leached chemicals into the environment (i.e. was construction debris recently disposed of at the

site, was rubberizing asphalt recently used at the site, was PAH concentrations observed to be higher adjacent to the construction debris or rubberizing asphalt etc).

Response: The subject statement reads "...inputs from rubblizing asphalt and building debris...", meaning: the process of reducing the asphalt and building debris to rubble. This is an unclear term, and the section will be revised to describe "crushed" asphalt and building debris. It is documented that such debris is present at the site shoreline, as evidenced in site photos provided in the sediment pre-design investigation reports and other pertinent documents.

**5. Section 4.2.1 Non Forensic Analysis,
Page 4-3, 4th Paragraph.**

This paragraph states that PAH concentrations decrease with depth. In support of this position please provide a set of tables that clearly delineates the depths of the samples for all sample locations throughout time (i.e. for each sampling event). Further graphs of either total PAHs or PRG PAHs should be created which depict sample concentrations versus depth for the different sampling events.

Response: The information requested above is provided in Table 4-3. A summary of the information is presented below. Other shoreline stations have not been sampled at multiple depths. For comparisons of individual PAHs, and PRG PAHs, refer to Table 4-3 of the report.

Sample Location No.	Date(s) Sampled	Depths Sampled	PAHs decrease with depth?
OFF - 5	3/37/98, 4/27/98	0-15cm, 20-25 cm, 55-60 cm	Yes
OFF - 6	3/37/98, 4/27/98	0-15 cm, 20-35 cm	Yes
SD - 432	11/13/01	0-6 inches, 18-24 inches	No
SD - 439	10/29/01, 11/13/01	0-6, 6-12, and 18-24 inches	Yes*
SD - 442	11/13/01	0-6 inches, 18-24 inches	Yes
SD - 445	11/13/01	0-6 inches, 18-24 inches	Yes - slightly

* highest concentrations were found in the 6-12 inch interval, and the results from 18-24 inch interval shows a decrease from the 6-12 inch sample.

**6. Section 4.2.2 Forensic Analysis,
Page 4-3, Whole Sections**

In previous correspondence and meetings the Office of Waste Management raised a number of questions concern the validity of the original forensic study performed at the site and the conclusions generated by the study. Accordingly, the study was not approved, and the Office of Waste Management stated that conclusions presented in the study could not be used as a foundation for decisions made at the site. The Navy then proposed to perform a second similar study. At that time the Office of Waste Management noted that its position concerning this matter has not changed. Specifically, the Office of Waste Management did not approve the proposal of performing a similar forensic study, nor will it accept any conclusions generated from such a study or any positions based upon such a study. At this time the Office of Waste Management position on this issue has not changed and comments will not be submitted on the forensic portion of this report.

Response: Comment noted. As stated in the Navy correspondence of October 1 2004 which responds to comments to the draft work plan for this effort, the Navy will continue efforts to gain a better understanding of the potential sources of PAHs in the sediments adjacent to the OFFTA site.